

CLAIMS

What is claimed is:

- 5 1. A magnetic memory cell, comprising:
sense layer for storing a magnetization state that
indicates a logic state of the magnetic memory cell;
structure that prevents disruptions to the
magnetization state in the sense layer.
- 10 2. The magnetic memory cell of claim 1, wherein the
structure overlaps a pair of opposing edge regions of
the sense layer and prevents one or more demagnetization
fields from forming in the edge regions of the sense
15 layer.
- 20 3. The magnetic memory cell of claim 1, wherein the
structure is formed from a permeable ferromagnetic
material having a shape that provides flux closure for
one or more demagnetization fields in the sense layer.
- 25 4. The magnetic memory cell of claim 1, wherein the
structure is formed from a permeable ferromagnetic
material having an easy axis that is perpendicular to an
easy axis of the sense layer.
- 30 5. The magnetic memory cell of claim 1, wherein the
structure encases a conductor that provides read and
write access to the magnetic memory cell.
6. The magnetic memory cell of claim 1, further
comprising a reference layer and a tunnel barrier
between the sense layer and the reference layer.

7. The magnetic memory cell of claim 6, wherein the sense layer is adjacent to the structure.

5 8. The magnetic memory cell of claim 6, wherein the reference layer is adjacent to the structure.

9. The magnetic memory cell of claim 1, wherein the sense layer is exchange coupled to the structure.

10 10. The magnetic memory cell of claim 1, wherein the structure is formed from a hard ferromagnetic material.

15 11. The magnetic memory cell of claim 10, wherein the hard ferromagnetic material is magnetized perpendicular to an easy axis of the sense layer.

12. The magnetic memory cell of claim 10, wherein the sense layer is exchange coupled to the structure.

20 13. A magnetic memory cell, comprising:
sense layer for storing a magnetization that indicates a logic state of the magnetic memory cell;
means for providing flux closure for one or more demagnetization fields in the magnetic memory cell.

25 14. The magnetic memory cell of claim 13, wherein the means for providing flux closure comprises a permeable ferromagnetic material having a shape that provides a path for magnetic flux transport between a pair of
30 opposing edge regions of the sense layer.

15. The magnetic memory cell of claim 14, wherein the permeable ferromagnetic material has an easy axis that is perpendicular to an easy axis of the sense layer.

5 16. A method for forming a magnetic memory with a set of structures, comprising the steps of:

forming a set of trenches in a substrate;

10 depositing a layer of magnetic material for the structures so that the magnetic material coats horizontal and vertical surfaces of the trenches and the substrate;

depositing a layer of conductor material on the layer of magnetic material to fill the trenches;

15 polishing the layer of conductor material and the layer of magnetic material to expose an upper surface of the substrate.

20 17. The method of claim 16, wherein the conductor material is copper.

18. The method of claim 16, wherein the step of polishing comprises the step of polishing using a chem-mechanical process.

25 19. The method of claim 16, wherein the step of forming a set of trenches comprises the step of forming a set of trenches using reactive ion etching.

30 20. The method of claim 16, further comprising the steps of:

depositing a material for a sense layer in each of a set of magnetic memory cells in the magnetic memory;

depositing a material for a tunnel barrier in each of the magnetic memory cells;

depositing a material for a reference layer in each of the magnetic memory cells.

5

21. The method of claim 16, wherein the material for the sense layer is deposited before the materials for the tunnel barrier and reference layers.

10

22. The method of claim 21, wherein the material for the reference layer is deposited before the materials for the tunnel barrier and sense layers.

~~ADD B~~
ADD C' >